

REMARKS

Claims 1- 23 are currently pending in this application. Claims 1, 3, 8, 11, 12-15, 19, 21 and 22 have been amended. No new matter has been added by these amendments. Applicants have carefully reviewed the Office Action and respectfully request reconsideration of the claims in view of the remarks presented below.

Claim Objections

Claims 2-4, 10, 11, 19, 21 and 22 were objected to for various informalities. These informalities have been addressed for in the amendments presented above.

Claim Rejections Under 35 U.S.C. §112

Claim 11 was rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Claim 11 has been amended to more distinctly recite the “blanking period” feature.

Claim Rejections Under 35 U.S.C. §102

Claims 12, 13, 18 and 19 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,128,529 (Esler).

Independent claim 12 relates to a method of dynamically establishing a maximum pacing rate in a cardiac stimulation device which paces the atria of a heart on demand at the end of an escape interval in a single-chamber atrial pacing mode. The method includes detecting an atrial activation of the heart; detecting an R wave of the heart corresponding to the detected atrial activation; determining a minimum RA interval having a beginning that corresponds with the R wave and an end; and determining if the end of the escape interval is before the end of the minimum RA interval and if it is, extending the escape interval so that its end coincides with the end of the minimum RA interval.

Independent claim 19 relates to a system for dynamically establishing a maximum pacing rate in a cardiac stimulation device which paces the atria of a heart on demand at the end of an escape interval in a single-chamber atrial pacing mode. The system includes detecting means for detecting an atrial activation of the heart and an R wave of the heart corresponding to the detected atrial activation; and a rate limit means for determining a minimum RA interval having a beginning that corresponds with the R wave and an end; determining if the end of the escape interval is before the end of the minimum RA interval and if it is, extending the escape interval so that its end coincides with the end of the minimum RA interval.

Esler discloses a method of maintaining a constant atrial pacing rate, *i.e.* atrial escape interval. In the Office Action, the time remaining in an AV interval after the detection of an R wave (*e.g.*, 300-150, with respect to figure 5, item 556) is equated to Applicants' claimed determining of a minimum RA interval; while the addition of the remaining time to a default VA interval (*e.g.*, 150 + 500, with respect to figure 5) is equated to Applicants' claimed imposing of a minimum RA interval on an escape interval.

Applicants disagree with the application of Esler to the claimed invention and submit that Esler does not impose anything on its atrial escape interval. It is the VA interval that has something, *i.e.*, time remaining in an AV interval after the detection of an R wave, imposed on it. The atrial escape interval in Esler is kept constant. See figures 5, 6 and 7. This is contrary to claims 12 and 19, wherein the atrial escape interval is dynamically adjusted, so as to extend to the time of termination of a minimum RA interval and thereby limit the atrial pacing rate as needed. See paragraph [0063] of the specification. Esler does not teach or suggest the escape interval adjustment recited in claims 12 and 19. More specifically, Esler does not teach or suggest determining if the end of the escape interval is before the end of the minimum RA interval and if it is, extending the escape interval so that its end coincides with the end of the minimum RA interval.

In view of the foregoing, Applicants submit that Esler fails to disclose the combinations of elements and features recited in independent claims 12 and 19. Accordingly, Applicants request reconsideration of the §102 rejections of these claims and dependent claims 13 and 18.

Claim Rejections Under 35 U.S.C. §103

Claims 1-5, 9, 10, 12, 14-16 and 19-21 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,101,416 (Sloman) in view of Esler.

Independent claims 1, 12 and 19 relate to systems and methods that dynamically establish a maximum pacing rate in an implantable cardiac stimulation device which paces the atria of a heart on demand at the end of an escape interval in a single-chamber atrial pacing mode. For example, claim 1 recites a system that includes a detector that detects an atrial activation of the heart and an R wave of the heart corresponding to the detected atrial activation; and a rate limit circuit that determines a minimum RA interval having a beginning that corresponds with the R wave and an end; determines if the end of the escape interval is before the end of the minimum RA interval and if it is, extends the escape interval so that its end coincides with the end of the minimum RA interval.

As stated above in the §102 remarks, Esler does not disclose determining if the end of the escape interval is before the end of the minimum RA interval and if it is, extending the escape interval so that its end coincides with the end of the minimum RA interval. As admitted in the Office Action, Sloman does not disclose these types of features either.

In view of the foregoing, Applicants submit that neither Sloman nor Esler, either alone or in combination, teach or suggest the combination of elements and features recited in independent claims 1, 12 and 19. Furthermore, Applicants submit that, by virtue of the incorporation of subject matter recited in their respective independent base claim, dependent claims 2-5, 9, 10, 14-16, 20 and 21 are nonobvious over Sloman in view of Esler.

PATENT

Claims 6, 7 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sloman and Esler and further in view of U.S. Patent No. 5,334,220 (Sholder). Claims 8, 11, 17 and 23 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sloman and Esler and further in view of U.S. Patent No. 6,711,438 (McClure).

In view of the foregoing analysis of independent claims 1, 12 and 19 in view of Esler and Sloman, Applicants believe that the rejections of dependent claims 6-8, 11, 17, 22 and 23 under §103 are moot as each of these claims depends from an allowable independent claim.

CONCLUSION

Applicants have made an earnest and bona fide effort to clarify the issues before the Examiner and to place this case in condition for allowance. Therefore, allowance of Applicants' claims 1-23 is believed to be in order.

Respectfully submitted,

7 MAR 2007
Date



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